Owen Andrew Hoekenga owen.hoekenga@ars.usda.gov

Education

Ph.D. in Biological Sciences (1998), University of Missouri-Columbia
Dissertation title "Epigenetic regulation of Pl-Blotched"
Karen Cone, advisor

B.S. in Cellular & Molecular Biology (1992), University of Michigan-Ann Arbor

Employment

2006-present	Research Molecular Biologist, USDA-ARS PSNRU, Ithaca NY (Retained/tenured May 2009) Assistant Professor (adjunct), *Plant Breeding and Genetics, Cornell University* Graduate Field Member, *Plant Breeding and Genetics, Cornell University* Assistant Scientist (adjunct), *Boyce Thompson Institute for Plant Research*
2004-2006	Senior Research Associate and Co-Principal Investigator, with Leon Kochian *Boyce Thompson Institute for Plant Research, Ithaca, NY*
2001-2004	Research Associate and Principal Investigator, with Leon Kochian *Department of Plant Biology, Cornell University*
1998-2001	Postdoctoral Research Associate, with Stephen Howell and Leon Kochian *Boyce Thompson Institute for Plant Research, Ithaca, NY*
1992-1998	Graduate Research Assistant, with Karen Cone *Division of Biological Sciences, University of Missouri*
Fall, 1997	Graduate Teaching Assistant, with Robin Kennedy *Division of Biological Sciences, University of Missouri*
1990-1992	Undergraduate Research Assistant, with Peter Kaufman *Department of Biology, University of Michigan*

Awards

2007 USDA NRICGP #2007-35100-18436. Kochian LV, Piñeros MA, and **Hoekenga OA**. Structural-functional analysis of *ALMT*-type transporters: identification of protein motifs conferring roles in aluminum tolerance. 3 years, **$201,871.**

2007 CGIAR Centers, Generation Challenge Program. *Co-principal investigator* among 8 from USDA-ARS, Cornell University, and Embrapa (Brazil). 2 years, **$600,000.**

2006 USDA NRICGP #2006-01124 Kochian LV, **Hoekenga OA** and Liu J. Molecular, biochemical and physiological analysis of Alt_{SB} - a major aluminum tolerance gene recently identified in sorghum. 3 years, **$400,000.**

2004 CGIAR Centers, Generation Challenge Program #IC69. Co-investigator among 12 from Cornell University (USA), Embrapa (Brazil) and Moi University (Kenya). 3 years, **$900,000.**

2004 NSF PGRP DBI #0419435 Kochian, LV, **Hoekenga OA**, Buckler ES and Rose JKC. Functional and comparative genomic analysis of aluminum tolerance in maize. 5 years, **$933,485.**

2002 USDA NRICGP #02-35100-12058 **Hoekenga OA** and Kochian LV. Identification and characterization of aluminum tolerance genes in Arabidopsis thaliana. 2 years, **$150,000.**

2001 USDA NRICGP #01-35301-10647 Kochian LV and **Hoekenga OA**. Identification and characterization of aluminum tolerance genes in grain crops. 3 years, **$270,000.**

1994 NIH Predoctoral Training Grant recipient NIGMS 5 T32 GM08396

Publications

• Kochian LV, **Hoekenga OA**, Magalhaes JV, and Pineros MA. 2009. p 367-380. *In* Handbook of Maize: its Biology (S. Wessler and J. Bennetzen, editors; Springer-Verlag) Maize Aluminum Tolerance.

• **Hoekenga OA**. 2008. *Journal of Biomolecular Techniques* 19(3):159-166. Using metabolomics to estimate unintended effects in transgenic crop plants: problems, promises and opportunities.

• Kobayashi Y*, **Hoekenga OA*,** Ito H, Nakashima M, Saito S, Shaff JE, Maron LG, Piñeros MA, Kochian LV, Koyama H. 2007. *Plant Physiology* 145:843-852. Characterization of *AtALMT1* expression in aluminum inducible malate release and its role for rhizotoxic stress tolerance in *Arabidopsis thaliana*. *co-first authors

• Magalhães JV, Liu J, Guimarães CT, Lana UGP, Alves VMC, Wang Y-H, Schaffert RE, **Hoekenga OA**, Shaff JE, Piñeros MA, Klein PE, Coelho CM, Kochian LV. 2007 *Nature Genetics* 39(9):1156-1161. A member of the multidrug and toxic compound extrusion 'MATE' family is a major gene that confers aluminum tolerance in sorghum.

• Küpper H, Ort-Seib L, Sivaguru M, **Hoekenga OA**, Kochian LV. 2007. *Plant Journal* 50:159-175. A method for cellular localization of gene expression via quantitative in situ hybridization in plants.

• **Hoekenga OA**, Maron LG, Piñeros MA, Cançado GM, Shaff J, Kobayashi Y, Ryan PR, Dong B, Delhaize E, Sasaki T, Matsumoto H, Yamamoto Y, Koyama H, Kochian LV. 2006. *Proceedings of the National Academy of Sciences (USA)* 103:9783-43. *AtALMT1*, which encodes a malate transporter, is identified as one of several genes critical for aluminum tolerance in Arabidopsis.

• Kochian LV, Piñeros MA, and **Hoekenga OA.** 2005. *Plant and Soil* 274(1): 173-202. The physiology, genetics and molecular biology of plant aluminum resistance and toxicity.

• Kochian LV, **Hoekenga OA**, and Piñeros MA, 2004. *Annual Review of Plant Biology* 55: 459-493. How do crop plants tolerate acid soils? Mechanisms of aluminum tolerance and phosphorous efficiency.

• **Hoekenga OA**, Vision TJ, Shaff JE, Monforte AJ, Lee GP, Howell SH, and Kochian LV, 2003. *Plant Physiology* 132(2): 936-948. Identification and characterization of aluminum tolerance loci in Arabidopsis (Landsberg erecta x Columbia) by quantitative trait locus mapping. A physiologically simple but genetically complex trait.

• Kochian LV, Pence NS, Letham DLD, Piñeros MA, Magalhães JV, **Hoekenga OA**, and Garvin DF, 2002. *Plant and Soil* 247(1): 109-119.Mechanisms of toxic metal resistance in plants: aluminum and heavy metals.

• **Hoekenga OA**, Muszynski MG, and Cone KC, 2000. *Genetics* 155(4): 1889-1902. Developmental patterns of chromatin structure and DNA methylation responsible for epigenetic expression of a maize regulatory gene.

• Krill AM, Kirst M, Kochian LV, Buckler ES, **Hoekenga OA**. 2010. *PLoS ONE* (in press). Association and linkage analysis of aluminum tolerance genes in maize.

• **Hoekenga OA** and Magalhaes JV. 2010. (in press) Mechanisms of aluminum tolerance. *In* Root Genomics (AC de Oliviera, editor). Springer-Verlag.

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Forthcoming publications

• **Hoekenga OA,** Mwaniki AM, Cheng Z, Rutzke MA, Hodgkinson VL, Krill AM, Craft EJ, Welch RM, Buckler ES, Szalma SJ, Glahn RP, Kochian LV. 2010. *Plant Physiology* (in revision). Genetic and physiological analysis of iron biofortification in maize kernels.

• Dubois P, Olsefski GT, **Hoekenga OA**, Flint-Garcia SA, Brutnell TP. 2010. *Plant Physiology* (in revision). The shade avoidance syndrome in maize: a genetic and physiological characterization of seedling developmental responses.

• Di Leo MV, Strahan GD, **Hoekenga OA.** 2010. *Plant Physiology* (in preparation). Application of weighted correlation network analysis (WGCNA) to explain variation in the tomato fruit metabolome.

Seminars Presented

• Maize Genetics Conference, St. Charles IL. 3/12-15/09. *Iron biofortification of maize grain*.

• Harvest Plus Technical Meeting on Improving Bioavailability of Minerals from Biofortified Staple Food Crops, International Food Policy Research Institute, Washington DC. 4/1/08. *Integrated genetic and biochemical strategies identify regions of the maize genome associated with increased seed iron bioavailability and content*

• University of Guelph, Department of Plant Agriculture, Guelph, ON Canada. 3/19/08. *Joint linkage-association analysis of aluminum stress tolerance in maize roots.*

• Cornell University, Department of Plant Breeding and Genetics, Ithaca NY. 3/11/08. *Evolution of a research portfolio: epigenetics, aluminum tolerance, iron nutrition and biotechnology risk assessment.*

• Plant and Animal Genomes, San Diego CA. 1/12-16/08. *Use of metabolomics to estimate unintended effects in transgenic tomato fruit.*

• American Society of Agronomy, New Orleans LA. 11/4 -8/07. *Genetic analysis of iron bioavailability in maize.*

• Oji Paper Ltd., Kameyama, Japan. 10/1/07. *Joint linkage-association analysis of aluminum tolerance in maize*.

• Gifu University, Faculty of Applied Biology, Gifu, Japan. 9/28/07. *Joint linkage-association analysis of aluminum tolerance in maize*.

• RIKEN Bio Resource Center, Tsukuba, Japan. 9/27/07. *Joint linkage-association analysis of aluminum tolerance in maize*.

• International Symposium on Plant Science for Biomass and Food Production in Acid Soils, Hokkaido University, Sapporo, Japan. 9/25-26/07. *Joint linkage-association analysis of aluminum tolerance in maize*.

• Northeast Corn Improvement Conference, Ithaca NY. 2/15-16/07. *Joint linkage-association analysis of aluminum tolerance in maize.*

• Plant and Animal Genomes, San Diego CA. 1/13-17/07. *Joint linkage-association analysis of aluminum tolerance in maize.*

• American Society of Plant Biologists, Boston MA. 8/5-9/06. *Natural ionomic variation in Arabidopsis identified an E3 ubiquitin ligase involved in regulating shoot Mo*. (co-presenter)

• Curriculum Development Workshop for High School Science Teachers, Boyce Thompson Institute for Plant Research, Ithaca, NY. 7/10-12/06. *Plants and soil: crop improvement and the study of plant-metal interactions.*

• Missouri Symposium, Plant Roots: From Genes to Form and Function, Columbia MO. 5/24-25/06. *Interdisciplinary analysis of aluminum tolerance in maize*.

• Maize Genetics Conference, Asilomar, CA. 3/9-12/06. *Interdisciplinary analysis of aluminum tolerance in maize*.

• Plant and Animal Genomes, San Diego, CA. 1/14-18/06. *Interdisciplinary analysis of aluminum tolerance in maize* (presenter) and *Map-based cloning and characterization of* Alt_{SB}, *a major aluminum tolerance gene in sorghum* (co-presenter)

• Cornell University, Department of Plant Breeding and Genetics, Ithaca, NY. 11/22/05. *Integrated analysis of aluminum tolerance in maize.*

• Embrapa Maize and Sorghum Research Center, Sete Lagoas, MG Brazil. 5/16/05. *Comparative genomic analysis of aluminum tolerance in* Zea mays *and* Arabidopsis thaliana.

• Brazilian Plant Breeding Congress, Gramado, RS Brazil. 5/9-12/05. *Comparative genomic analysis of aluminum tolerance in crop and model plants.*

• Plant and Animal Genomes, San Diego, CA. 1/15-19/05. *Functional and comparative analysis of aluminum tolerance in* Zea mays.

• Purdue University, Department of Horticulture and Landscape Architecture, West Lafayette, IN. 10/14/04. *Aluminum tolerance in* Arabidopsis thaliana *(Ler x Col): physiologically simple, but genetically complex*

• Aluminum stress research in plants: A discussion on the present status and new directions for future, Okayama University, Kurashiki, Japan. 8/7/04. *Aluminum tolerance in maize: genetic evidence for alternate tolerance processes.*

• International Symposium on Plant-Soil Interactions at Low pH, Sendai, Japan. 8/1-5/04. *Aluminum tolerance in* Arabidopsis thaliana *(Ler x Col): physiologically simple, but genetically complex.*

• Pennsylvania State University, Department of Biology, University Park, PA. 4/29/04. *Aluminum tolerance in* Arabidopsis thaliana *(Ler x Col): physiologically simple, but genetically complex.*

• Cornell Institute for Biology Teachers, Ithaca NY. 6/30/03. *Plants & soil: crop improvement & the study of model plants*.

• Plant and Animal Genome, San Diego, CA. 1/11-15/03. *Aluminum tolerance in* Arabidopsis thaliana *is physiologically simple but genetically complex.*

• Cornell University, Department of Plant Biology, Ithaca, NY. 9/27/02. *Aluminum tolerance in* Arabidopsis thaliana *(Ler x Col): physiologically simple, but genetically complex.*

• Cornell Institute for Biology Teachers, Ithaca, NY. 7/18/02. *Feeding the world using a little plant.*

• Plant and Animal Genome, San Diego, CA. 1/12-16/02. *Molecular, genetic and physiological investigations of plant aluminum tolerance mechanisms*. (Co-presenter)

• Root-Soil Interface Symposium, Ithaca, NY. 4/12/01. *Understanding aluminum tolerance mechanisms in* Arabidopsis thaliana.

• Maize Genetics Conference, Clearwater Beach FL. 3/13-16/97. Teopod1 and Teopod2 *influence the methylation state of* Pl-Blotched.

Posters Presented

Association of Biomolecular Resource Facilities: 2008
American Society of Plant Biologists: 2006*, 2004*, 2003*, 2001, 2000, and 1999
Experimental Biology (FASEB): 2007*, 2006*
Gordon Research Conferences: 1997 (2)
Keystone Symposia: 2004
Maize Genetics Conference: 2009*, 2007, 2006, 2005, 1996, and 1995
Plant and Animal Genomes: 2008, 2006 (2*) and 2002

**co-presenter*

Professional Service and Synergistic Activities

• Peer reviewer: *BMC Plant Biology; Canadian Journal of Botany; Food Control; Genetics; Molecular Breeding; Plant Physiology; Plant Molecular Biology; Plant and Soil; Plant, Cell and Environment; Plant Physiology and Biochemistry; Theoretical and Applied Genetics*
• Peer reviewer for USDA-NRI Plant Responses to the Environment and Plant Genetic Mechanisms, NSF Eukaryotic Genetics panels; European Science Foundation; Netherlands Genomics Initiative; External reviewer for Agriculture and Agri-Foods Canada
• Member of Agronomy Society of America, American Society of Plant Biologists, Crop Science Society of America, Genetics Society of America and Sigma Xi
• Laboratory/recitation teaching assistant for "Introduction to Botany" at Missouri (Fall 1997)
• Guest Lecturer, Department of Plant Biology, Cornell University (Spring 2005, 2007 and 2009)
• Guest Lecturer, Department of Plant Breeding and Genetics, Cornell University (Fall 2007, 2008, 2009; Spring 2009)
• Instructor for "Evolution of Plant Breeding and Genetics" at Cornell University (Spring 2009)
• Member of special committees for Patrice Dubois (Ph.D. candidate, Department of Plant Breeding and Genetics, Brutnell Lab), Allison Krill (Ph.D. candidate, Department of Plant Breeding and Genetics, Buckler Lab), Mercy Lung'aho (Ph.D. candidate, Department of Food Science, Glahn Lab) and Visha Venugopalan (M.P.S. candidate, Department of Plant Breeding and Genetics, Hoekenga Lab)
• Trained and supervised 3 postdoctoral associates, 6 technical assistants, and 19 undergraduate students since 1998 (18 females, 12 males)
• Co-organizer for Living Maize Map demonstration garden, Cornel University (2006, 2007)
• Participated in the Science Olympiad both as a contestant (district, state [MI] and national competitions, 1988) and a judge (state [MO], 1997).
• Extramural grants awarded as principal or co-principal investigator: $3,455,356 (7 successful proposals).